General Physics I, PHY 130-02

COURSE MEETING TIME AND PLACE:

Course Section	Meeting Time	Format	Location
130-02 (lecture)	MoWeFri 12:00-12:50 pm	Remote Synchronous	Zoom (see link below)
130-92 (discussion)	Mo 2:00-2:55 pm	Remote Synchronous	Zoom (see link below)

COURSE DESCRIPTION:

Physics 130 (General Physics 1) is the first semester of an introductory, algebra based, physics sequence. Topics covered include kinematics, dynamics, the mechanics of solids and fluids, wave motion, heat and temperature, and kinetic theory. In less technical language, we will cover the mathematical description and modeling of motion (kinematics), how forces give rise to changes in motion (dynamics), and a number of applications on the macroscopic and microscopic world. *Physics 130 is primarily a service course for students in biological and health science fields, so we will emphasize applications to these fields.*

A laboratory portion of this course will provide experience with these phenomena discussed in lecture and give a glimpse into how scientists discovered physical laws.

Please note Physics 130 is also an approved science distributive course in WCU's general education program (see the General Education statement later in this document.)

Prerequisites: A good working knowledge of algebra and trigonometry are pre-requisites for this course. Mathematical language provides the precision required to state physical laws and the tools to manipulate them. We will be using algebra and trigonometry on a daily basis. ***If you feel you have any deficiencies in your mathematical preparation please see me.***

INSTRUCTOR INFORMATION:

Dr. Shawn H. Pfeil
e-mail: spfeil@wcupa.edu (please include course and section number on subject line)
phone: (610) 430-4084
office: Schmucker Science South 229 (Current location: My basement office.)

WCU OFFICIAL COVID-19 STATEMENT

Part of West Chester University's response to the COVID-19 pandemic was to switch the vast majority of instruction to remote. This decision was made out of an abundance of caution to protect the health of all members of the WCU community. Faculty have been asked to make every effort to adapt their courses to this novel situation while still meeting the critical learning outcomes of the course. Students are asked to discuss any problems with the new course format and schedule directly with their instructors. Patience and flexibility on everyone's behalf are critical to our community's navigation of this public health crisis.

For this particular course, the following alternative modalities are being utilized: Instruction over Zoom video conferencing, which is offered synchronously, but some of it may be accessed asynchronously (see below), a prerecorded lab experiments with synchronous work on Zoom in "lab groups" (see lab supplement), and exams proctored remotely on Zoom.

WHERE AND WHEN YOU ARE REQUIRED TO ATTEND ONLINE:

- **When are you required to attend synchronously?**
    - You are required to attend the **recitation sections**, i.e. the second meeting on Monday labeled M2 on the calendar, from 3-4 pm synchronously. In this discussion section we will be working on carefully chosen problems in small groups. *This weekly meeting has graded activities associated with it (see further along in the syllabus).*

- Exams are proctored in real time synchronously on Zoom (see further along in the syllabus). You must attend synchronously at those times.

- **When do I suggest you attend synchronously?**
  The regular class periods MoWeFri 12:00 pm -12:50 pm will be hosted on Zoom. *I strongly suggest attending these meetings live, so that you can ask questions in real time.* Being able to stop me and ask a question as it occurs is one of the key advantages of a live class. *I will also be posting the lecture videos on D2L, which will allow you to rewind, revisit, or view them asynchronously.* Occasionally, and only where appropriate, we may have one of these live sessions replaced with a pre-recorded lecture. In this case you will be notified in advance.
- **Can you attend asynchronously?**
  I understand that you may have issues that arise, for example an internet outage, which may keep you from attending the regular lecture period. Don't worry about it too much, the lecture will be posted on D2L. I also understand that you may be suffering from "Zoom fatigue," or simply want the flexibility of asynchronous instruction. In that case, you are free to review the lecture content videos at your leisure. ***But…***you need to make sure you keep on the course schedule. ***And***…I strongly suggest attending in person when possible to ask questions.
- **What is the Zoom login information for this class:**
  https://wcupa.zoom.us/j/95314771496?pwd=eC9ib3lyUFdHN0pPSVBBcmNOUmVidz09
  Meeting ID: 953 1477 1496
  Passcode: 571456
  You must use some version of your real name. I utilize a Zoom waiting room, and I only let in people I know are in the class.
  We will use the same Zoom meeting ID for both the lecture and recitation. I will e-mail your official WCU e-mail with any changes.
- **What about privacy concerns related to Zoom lectures?**
  - *I don't want my video recorded.*
    I have set the record settings for our class so that the shared screen, i.e. slides and the tablet I am working problems out on is recorded & the audio track is recorded. Your video will not be recorded. *If you ask a question via audio your voice will be recorded.*
  - *I am uncomfortable having my voice recorded.*
    During Zoom lectures. If you are uncomfortable having your voice recorded, or asking questions publicly – you can also use Zoom's private chat feature to ask questions.
  - If you are comfortable turning on your video please do so. Nonverbal communication is really useful to me when I teach. It is one of the ways I determine if the pace is too high, too low, or about right.

OFFICE HOURS:

My scheduled office hours as of the first day of class are listed below. I reserve the right to adjust this schedule to reflect unforeseen circumstances. Please note homework assignments are **due Tuesday evenings at 11:59 pm**.

I will be using Calendly to schedule office hours at www.calendly.com/spfeil. Please note: I am available on short notice during the entire office hour. The use of a scheduler is simply to avoid having to stay logged into Zoom if no one is present.

Tuesday	Thursday	Friday
9:30-11:30 am	12:30 – 2:30 pm	8:00 – 9:00 am

Office hours are available by appointment for students with an ongoing conflict with my scheduled hours.

REQUIRED COURSE MATERIALS & INCLUSIVE ACCESS:

Textbook and Homework System: Physics 5/e by Walker with Modified Mastering Physics.

The textbook, in an e-book form, and homework for this system are provided through WCU's inclusive access program. This means you should see a $112.93 charge for Mastering Physics for Physics 5/e by Walker appear on your Bursar's account. This is a discounted from the online purchase price of $146.65. Both are for 24 month access which is typically long enough to complete PHY 130 and PHY 140.

Gaining Access: You will be able to register for Modified Mastering Physics with the e-book included directly from the courses D2L (course management) website.

If You Already Have Access or Drop the Course: You can opt-out of inclusive access until the drop/add deadline of September 3rd. You should have received an e-mail with a link to do this. If you opt-out you receive a refund. *If you are retaking and already have a Modified Mastering Physics account opt out and use your old login to access the resources through D2L.*

If You Want a Paper Copy: You can order a loose-leaf copy of the book directly from the publisher while logged into Modified Mastering Physics. There is a "Purchase Option" link on this website. The cost from Pearson is $44.99.

Calculator: You will want a basic scientific calculator for this course. Something at the level of a Ti-30 or nicer is recommended. These cost as little as $15. You do not need a graphing calculator.

Please note you will never be able to use your cell-phone as a calculator in class. It may however be worth finding a nice calculator application for your phone for doing homework. If you do this, try to get an emulator for the same model as you purchase.

WEST CHESTER UNIVERSITY GENERAL EDUCATION LEARNING OUTCOMES:

PHY 130 is approved as a WCU General Education Science Distributive course, and as such meets the following General Education Goals:

Gen Ed Goal #1: Communicate effectively
Gen Ed Goal #2: Think critically and analytically
Gen Ed Goal #3: Employ quantitative concepts and mathematical methods

More specifically, after successfully completing this course a student will be able to:
1. Mathematically describe mechanical systems using the language of kinematics.
2. Recognize and distinguish between the concepts of physics in action within mechanical systems, including force, energy, momentum, harmonic motion, and wave phenomena.
3. Analyze mechanical systems through visualization, modeling, algebra, as well as diagrammatic and graphical techniques.
4. Assemble the above elements in order to solve multi-part problems and formulate quantitative predictions for physical experiments.

Student learning outcomes will be met and assessed through the following activities:

- **Communicate effectively:** This course develops a student's ability to express oneself effectively in common college-level written forms (Gen Ed SLO #1a). In class, peer instruction specifically in recitation, give students practice communicating physical concepts in plain language. Homework assignments develop a student's ability to describe physical systems in the mathematical language of kinematics. Laboratory activities, performed in groups of 2-3 students, provide furtherpractice explaining physical

systems with brevity and mathematical precision. Effective written communication is assessed through short-answer conceptual questions on exams, as well as Post-Lab Assignments.

- **Think critically and analytically**: This course develops a student's ability to construct and/or analyze arguments in terms of their premises, assumptions, contexts, conclusions, and anticipated counter-arguments (Gen Ed SLO #2b), as well as reach sound conclusions based on a logical analysis of evidence (Gen Ed SLO #2c). In mechanics, critical thinking most often takes the form of identify/analyze/predict: (i) identify the aspects of physical system which determine its motion, (ii) analyze the system using physical concepts and mathematical relations, and (iii) develop a quantitative prediction for the system's behavior. Lecture, in-class activities, and homework problems all work to develop a student's skill in this process. For example, a common in-class activity is to propose a brief experiment and ask students to formulate a prediction for the outcome of that experiment. The experiment is then performed, and students are asked to analyze the assumptions and logic that led to their prediction. Student achievement in this critical thinking process is assessed through multiple choice questions and analytic free-response problems on exams. Critical and analytical thinking is also developed in the lab. Laboratory exercises ask students to synthesize experimental results and physical reasoning in order to construct explanations of observed behavior, formulate predictions for future experiments, and critically assess the quality of their data. Student achievement in these skills is assessed through written Lab Exercises and Post-Lab Assignments.
- **Employ quantitative concepts and mathematical methods**: This course develops a student's ability to employ quantitative methods to examine a problem in the natural or physical world (Gen Ed SLO #3a), as well as apply the basic methods and thought processes of the scientific method for natural/physical science in a particular discipline (Gen Ed SLO #3b). As a course in mechanics, essentially every element of this course involves quantitative methods and problem-solving. Quantitative tools such as algebra, trigonometry, and vectors are employed in every aspect of the course. Lecture presentation and textbook material train students in the following problem-solving skills: organizing information, visualizing and diagramming, recognizing concepts, strategizing solutions, combining mathematical relations, and assessing results. Weekly laboratory sessions allow students to actively apply the scientific method in order to explore physical phenomena and verify their predictions. For instance, in a lab on projectile motion students are tasked with predicting the distance a ball will travel when shot out of a launcher. Students determine the initial launch speed of the ball empirically, then utilize their measurement to model the ball's flight and ultimately predict the ball's landing position. Students then critique and refine their analysis based upon the accuracy of their result. While quantitative problem-solving is an ingredient in every aspect of the course, it is primarily assessed through exam questions and through written Lab Exercises.

TIME COMMITMENT:

The life of a college student is not easy. A full time student can expect to spend about 40+ hrs per week on coursework, or about 10+ hrs per week per course. This is significantly more than our formal meeting time of 5.3 hrs a week including lab. You should be spending 4.7+ hrs a week outside of our meetings doing homework problems, reading, & practice problems.

HOW YOUR GRADE WILL BE CALCULATED (ASSESSMENT):

I will be using the D2L grade-book feature to post course grades. Please check it periodically.

- **Laboratory** (15%): You will be assigned a percentage in lab by your lab instructor. I will use this to calculate the laboratory portion of your grade.
- **Homework** (15%): Homework assignments are due at 11:59 pm on Tuesdays **All assignments have a clearly labeled due date on Modified Mastering Physics. It is your responsibility to check Modified Mastering Physics periodically for assignment updates.**

  Solutions to all homework problems are available on the online system immediately after the assignment is due. Because solutions are available immediately late homework will not be considered.

- **Recitation Problems** (5%): Our second meeting on most Mondays will be used for recitation, a problem solving session. In this recitation you will be split into groups of 3-4 students and asked to work on a set of problems. At the end of the recitation period you will turn in a write-up of one specific problem as a group. Each recitation problem set will be graded as either satisfactory 1 point or unsatisfactory 0 points. Guidelines will be given for what is considered a satisfactory problem write-up. ***Recitations problems will be collected on Crowdmark.*** *I will drop your lowest recitation problem-set score.*
- **Exams:**

  Regular Exams: (50%): We will have four (4) regular exams. ***Your lowest regular exam score will be dropped.*** This means each exam which is kept will count for 16.67% of your final grade.

  Cumulative Final: (15%): We will have a cumulative final worth 15%.

  If you miss a regular exam : If you miss an exam for a **University Sanctioned Event** you must notify me in advance so that we can arrange for you to take the exam in a manner consistent with its integrity. You must also provide some form of documentation (performing arts program, competition schedule etc.) If you miss an exam due to sickness, a death in the family, or another reasonable reason, talk to me.

  If you have an OSD letter pertaining to exams: You are responsible for making the appropriate arrangements **prior** to the exam date and time. Please note the proctoring center requires that you schedule at least a week in advance.

I will be using the official WCU scale for grades. However, I reserve the right to adjust the weights of individual components, or the scale to account for unforeseen circumstances.

I use the standard WCU grade scale (see below). I round up on 0.5. For example, 92.5% is an A not an A-.

Letter	Grade Points	Percentage	
A	4.000	93 - 100	Excellent
A-	3.670	90 - 92	
B+	3.330	87 - 89	Superior
B	3.000	83 - 86	
B-	2.670	80 - 82	
C+	2.330	77 - 79	Average
C	2.000	73 - 76	
C-	1.670	70 - 72	
D+	1.330	67 - 69	Below Average
D	1.000	63 - 66	
D-	0.670	60 - 62	
F	0.000	59 or lower	Failure

SOFTWARE AND WEB RESOURCES

This course does not require you to purchase anything other than the license for MasteringPhysics (the homework system.) However, we do use a couple of different online resources.

D2L, our Learning Management System (LMS) and its resources:

When you log into D2L and select our course PHY 130-02. You will land on an entry page. All of the material you need to access for the course is one or two clicks away at this point. The navigation bar at the top has been edited to allow quick navigation. Let us go through the tabs.

- Content – this will allow you to go to the standard D2L content browser where you can find anything which has been uploaded. However, it is somewhat redundant because I've put the D2L content browser widget on the landing page. We have several folders under content.
    - Lecture Videos – this is where I will be posting the recordings of all Zoom lectures. Also any asynchronous content will be posted here. Sub-folders split the videos up by what exam their content is appearing on.
    - Homework – This link goes to the same place as the Textbook/Homework link in the main navigation bar.
    - Tests – This has two subfolders. One where I have posted an equation sheet you get to use on all exams. The second is where exam solutions will appear.
    - OneNote this links out to a OneNote notebook with lecture notes I will be annotating in real time, and which you can access later to see worked examples and etc.
- Communications – This has various tools for communicating. The class list is probably the most useful feature here. It will allow you to communicate with your peers in the class.
- Zoom – this is a link to the Zoom tab in communications which takes you to your WCU zoom account.
- Textbook/Homework –this is a link to VitalSource which in turn links to the textbook and homework system available through inclusive access. (This is the minimum number of clicks consistent with the way inclusive access is being run for this text.)
- Gradebook – a direct link to the D2L gradebook. You can check your grades in real time.
- OneNote Notebook – a direct link to a OneNote notebook where I will be annotating the lecture notes.

Crowdmark

We will be using Crowdmark to collect exams and recitation problems. I'll send information about it in a separate document.

D2L/MASTERING PHYSICS:

We will be using two online platforms for this course Modified Mastering Physics, the publisher's homework system, and D2L. Homework assignments are to be performed on Modified Mastering Physics. To allow for *structured note taking* I will post my lecture slides prior to class. These slides intentionally leave some information, such as example solutions out, and provide space to fill that material in during lecture. **It is your responsibility to check these resources periodically for any updates and announcements. You may want to set D2L to notify you when new content is posted.**

ATTENDANCE POLICY:

Attendance is taken is taken for this course. Attending lecture, while highly correlated with success in this course is not graded.

PHYSICS TUTORING:

Physics tutoring is available through LARC (610) 436-2535. In the past peer tutoring has also been available from SPS (the Society of Physics Students). If SPS tutoring becomes available this semester I will make an announcement. **These should be considered in addition to my office hours, which are the first place you should stop for additional help.**

INTELLECTUAL PROPERTY STATEMENT:

I, the instructor, utilize copyrighted materials under the "Freedom and Innovation Revitalizing the United States Entrepreneurship Act of 2007" (Fair Use Act). Apart from such copyrighted materials, all other intellectual property associated with this course is owned and copyrighted by the instructor, including, but not limited to, lectures, course discussions, course notes, slides, assessment instruments such as exams, and supplementary materials posted or provided to students authored by the instructor. No recording, copying, storage in a retrieval system, or dissemination in any form by any means of the intellectual property of the instructor, in whole or in part, is permitted without prior written permission of

the instructor. When such permission is granted, it must specify the utilization of the intellectual property and all such permissions and waivers shall terminate on the last day of finals of the semester in which this course is held.

Statements Common to All WCU Undergraduate Syllabi

ACADEMIC & PERSONAL INTEGRITY

It is the responsibility of each student to adhere to the university's standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work, that involves misrepresentation of your own work, or that disrupts the instruction of the course. Other violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another's work and/or using ideas of another and presenting them as one's own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Proof of academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Integrity, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to the Department Undergraduate Handbook, the Undergraduate Catalog, the Ram's Eye View, and the University website at www.wcupa.edu.

STUDENTS WITH DISABILITIES

If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University's Services for Students with Disabilities (OSSD), please visit them at 223 Lawrence Center. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is ossd@wcupa.edu, and their website is at www.wcupa.edu/ussss/ossd. In an effort to assist students who either receive or may believe they are entitled to receive accommodations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, the University has appointed a student advocate to be a contact for students who have questions regarding the provision of their accommodations or their right to accommodations. The advocate will assist any student who may have questions regarding these rights. The Director for Equity and Compliance/Title IX Coordinator has been designated in this role. Students who need assistance with their rights to accommodations should contact them at 610-436-2433.

EXCUSED ABSENCES POLICY

Students are advised to carefully read and comply with the excused absences policy, including absences for university-sanctioned events, contained in the WCU Undergraduate Catalog. In particular, please note that the "responsibility for meeting academic requirements rests with the student," that this policy does not excuse students from completing required academic work, and that professors can require a "fair alternative" to attendance on those days that students must be absent from class in order to participate in a University-Sanctioned Event.

REPORTING INCIDENTS OF SEXUAL VIOLENCE

West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to comply with the requirements of Title IX of the Education Amendments of 1972 and the University's commitment to offering supportive measures in accordance with the new regulations issued under Title IX, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX

Coordinator. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project**. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University Protection of Minors Policy**. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at:
https://www.wcupa.edu/_admin/diversityEquityInclusion/sexualMisconduct/default.aspx

EMERGENCY PREPAREDNESS

All students are encouraged to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information, visit www.wcupa.edu/wcualert. To report an emergency, call the Department of Public Safety at 610-436-3311.

ELECTRONIC MAIL POLICY

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.

ALL OTHER ACADEMIC POLICIES

For any university wide academic policy not explicitly covered in this document, such as No Grade policies. Please consult your major advising handbook, the Undergraduate Catalog, the Ram's Eye View, or the University Website.

COURSE SCHEDULE: (next page): A tentative schedule for the course follows. Although I will endeavor to stick closely to the schedule as posted below, I reserve the right to modify it as needed over the course of the semester.

Date (mm/dd)	Day	Topic	Reading	Lab (Wed or later)
08/24	M1	Introduction to the course…what is Physics?		Orientation
Week 1	M2	Units, Dimensional Analysis, Unit Conversion	1.1-1.3,1.5-1.7	
	W	Distance & displacement, speed & velocity	2.1-2.2	
	F	Instantaneous Velocity & Acceleration	2.3-2.4	
08/31	M1	Constant Acceleration	2.5-2.6	LAB 1A
Week 2	M2	*1D Kinematics Problems*		
	W	Free Fall	2.6-2.7	
	F	Vectors I	3.1-3.5	
09/07	M1/M2	**Labor Day – NO CLASS**		LAB 1B
Week 3	W	Vectors II	3.1-3.5	
	F	2D Kinematics, Projectile motion w/ zero launch angle	4.1-4.3	
09/14	M1	Problems Projectile motion with an arbitrary angle	4.4-4.5	LAB 2
Week 4	M2	*Kinematics Review Problems*		
	W	Newton's 1st and 2nd Laws	5.1-5.3	
	F	**Exam 1: Kinematics CH 1-4**		
09/21	M1	Newton's 3rd Law , The vector nature of forces	5.4-5.5	LAB 3
Week 5	M2	*Force Problems*		
	W	Weight & Normal Force	5.6-5.7	
	F	Friction	6.1	
09/28	M1	Tension and Spring Forces	6.2	LAB 4
Week 6	M2	*More Force Problems*		
	W	Translational Equilibrium	6.3	
	F	Circular motion acceleration and force	6.5	
10/05	M1	Work and Kinetic Energy	7.1-7.2	LAB 5
Week 7	M2	*Force Review Problems*		
	W	Work Energy Theorem	7.2	
	F	**Exam 2: Forces CH 5-6**		
10/12	M1	Work done by a variable force, Power	7.3-7.4	**NO LAB**
Week 8	M2	*Work-Energy Theorem Problems*		
	W	Conservative and Non-Conservative Forces, Potential energy	8.1-8.2	
	F	Conservation of Mechanical Energy, Work Done by Non-Conservative Forces	8.3-8.4	
10/19	M1	Momentum and Impulse	9.1-9.3	LAB 6
Week 9	M2	***Momentum Problems***		
	W	Conservation of Momentum and Inelastic Collisions	9.4-9.5	
	F	Elastic Collisions and Center of Mass	9.6-9.7	
10/26	M1	Rotational Kinematics	10.1-10.2	LAB 7
Week 10	M2	***Energy and Momentum Review Problems***		
	W	Connection between Linear and Rotational Quantities, Rolling	10.3-10.4	
	F	**EXAM 3: Energy and Momentum CH 7-9**		
11/02	M1	Rotational Energy and Inertia	10.5-10.6	LAB 8
Week	M2	*Rotational Kinematics Problems*		

	W	Torque	11.1-11.2	
	F	Zero Torque and Static Equilibrium, Center of Mass and Balance	11.3-11.4	
11/09	M1	Angular Momentum and Conservation of Angular Momentum	11.6-11.7	LAB 9
Week 12	M2	*Torque and Equilibrium Problems*		
	W	Periodic Motion and SHM	13.1-13.3	
	F	Mass on a Spring, Period and Energy Conservation	13.4-13.5	
11/16	M1	The Pendulum	13.6-13.8	LAB 10
Week 13	M2	*Simple Harmonic Motion Problems*		
	W	The Doppler Effect	14.6	
	F	Superposition and Interference	14.7	
11/23 Week 14		**Fall Break/THANKSGIVING BREAK**		**NO LAB**
11/30	M1	Standing Waves	14.8	**NO LAB**
Week 15	M2	*SHM and Waves Review Problems*		
	W	Fluids: Density, Pressure, Pressure and Depth	15.1-15.3	
	F	**Exam 4: Rotation, SHM, and Waves CH 10-11, 13-14**		
12/07	M1	Pascal and Archimedes	15.3-15.5	**NO LAB**
Week 16	M2	Fluid flow, Viscosity	15.6,15.9	
		Final Exam **130-02, Wednesday 12/09/2020 1 pm – 3 pm**		